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REMARKS ON THE NEED OF MORE EFFICIENT PROTECTION OF THE EYE AFTER CATARACT EX- TRACTION, AND AN IM- PROVED APPARATUS FOR THE PURPOSE.

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Perfect coaptation and support of the corneal flaps, freedom from any form of pressure that may cause gaping of the lips, or reopening of the wound, and perfect rest of the eye, are the objects mainly in view in adopting any form of dressing after the extraction of cataract. That any imperfect coaptation, or motion of the lips of the wound will interfere with its speedy and perfect union, and, that every reopening of the wound retards recovery and subjects the eye to dangers from infection and inflammatory reaction, are propositions so axiomatic that no one will dispute them. They seem to be universally received principles, though in practice we hardly take the precautions we ought to observe in



order to secure our patients against these sources of danger. Mackenzie in his chapter on the after-treatment of extraction, writes as follows :

“ A careful assistant or experienced nurse, sitting constantly by the bedside for the first forty-eight hours, and for several succeeding nights, ought to attentively watch the patient when he wakes, and taking care especially, that he does not turn round suddenly upon the eye which has been cut or put up his hand to rub it. If there is any particular reason to dread the latter accident, it may be proper to muffle the patient's hands and pin them down by his sides.

“ The length of time during which the patient is to be kept in bed, is a point upon which there has been a wide diversity of practice. It would appear that Wenzel was at one time in the habit of confining his patients to their backs, without change of posture for a fortnight or three weeks, but that afterwards he shortened the period of confinement to eight or ten days. Mr. Phipps, on the other hand, examined the eyes on the morning after the operation, applied a shade and allowed the patient to rise.¹ A middle course appears to be the most judicious. The incision may be looked at the third day. On the fourth day the patient may be allowed to sit up for a short time. On the fifth the eye may be fairly examined, but immediately afterward covered with a shade. In eight or ten days the pa-

¹ On the Treatment of Patients after the Operation of Cataract, by Jonathan Wathel Phipps. London. 1792.

tient may be allowed to look at large objects and look about the room."²

Lawrence says: "The coverings of the eye should be light; a soft rag doubled and wetted in water, may be gently bound on the eye by a single narrow linen band, and the other may be covered in the same way. Recollect that the eye is naturally open to the air, and that a sound eye would be heated and rendered uneasy if it were bandaged up.

"The method followed by Beer and most of the German operators, of closing the lids by a strip of sticking plaster carried from the forehead to the cheek seems to me most objectionable.

"We must not, therefore, regard it as a rule, that the patient is to be bandaged. The light covering I have recommended is rather employed to keep the eye quiet, and guard it from any slight accident, than as a measure absolutely necessary; on the latter account it is proper to have the eye covered during the night, but it may be left open, or at least with thin wet rags only on it when the patient is awake."³

This open method of treatment seems to have been quite common until von Graefe advocated the use of the pressure bandage in connection with the operation he devised, and which soon became so general.

² Diseases of the Eye, by William Mackenzie, Edition of 1833. Boston, Carter, Hendee & Co.

³ A Treatise on the Disease of the Eye, by W. Lawrence, F.R.S. London, 1833. Pp. 425 and 426.

We are to-day debating the same questions that divided the colleagues of Lawrence and Mackenzie. While we do not direct that a faithful assistant or nurse watch continuously by the bedside for two whole days and several succeeding nights to see that no injury is inflicted upon the eye, we may sometimes wish we had.

As it was more than a century ago with the followers of Wenzel and Phipps, so to-day we have practically two methods of dressing the eye after cataract extraction.

By one method the lids are kept closed by the application of a cushion of absorbent cotton, charpie, or common cotton, held in place by a protective bandage. This may be applied lightly according to the directions of Stellwag and other writers, or with quite firm pressure, as advised by Graefe, and still preferred by some.

By the other method of dressing the lids are held together by strips of adhesive plaster, the eye being otherwise left free from covering or pressure. This is what is now known as the open method, and is advocated by several members of this Section.

I think it will be conceded that each of these methods has some advantage which the other does not offer, and also that neither fulfils all the indications that we attempt to meet by the dressings we adopt after an extraction.

I think it will also be quite generally admitted that the closed lid, with no artificial pressure, constitutes the best and safest splint for holding

the lips of the wound in coaptation after the operation, and that the closing of the lids of both eyes conduces to that perfect rest of the operated eye essential to its greatest safety.

There are many who believe it nearly, if not quite, impossible to apply a bandage with that firmness necessary to maintain its position, without exercising unequal pressure upon the eyeball, sufficient, at times, to interfere with speedy healing of the wound and reestablishment of the anterior chamber. If the bandage should happen to slip in any way, either from below upward, from above downwards, or from side to side, this unequal pressure is almost sure to be produced, and such accident is not unfrequently the evident cause of reopening of the wound. The method of dressing the eye with large pads of cotton and a pressure bandage has been retained partly with a view of protecting the eye from slight blows, which might prove more harmful in the open method of dressing. That the pad and bandage, though it affords some protection from slight blows, can offer no sufficient resistance to severe blows, is too evident to need discussion.

It has always been my custom to apply with great care the usual pad and bandage, to guard against its slipping by a second bandage of thin material applied by several turns outside of the first bandage, and passing under the chin and over the vertex, and finally fastening the two securely together, so as to prevent any motion of that part of the original bandage which covers

the eyes. To guard against blows I have impressed the assistants with the necessity of great caution in their manipulation, and during sleep have had the patients hands so secured, that while a certain degree of motion was allowed, there was no possibility of getting them up to the eye so as to rub or strike it.

Notwithstanding these precautions several accidents have happened that have impressed me with the need of more efficient means of protection than are in common use, and with the necessity of having such appliance cause so little annoyance to the patient, that they may be willingly tolerated until the wound has had time to become very firmly healed.

A brief account of a few accidents that have happened to my patients will serve to illustrate the nature and extent of the danger against which we ought to provide better protection.

Case I.—A lady of 55 was operated upon by me for cataract of the left eye, by the old method of simple extraction with Beer's knife. Operation smooth. On the third day the eye was opened. The anterior chamber was restored, the pupil was clear and central, and vision seemed good. On the fourth and fifth days the eye was examined and showed no sign of complication. On the morning of the sixth day, after the eye had been dressed, she suddenly pitched her head forward with considerable force, and struck the operated eye against a chair post. The wound was reopened, the iris prolapsed, and the anterior

chamber filled with blood. Although the prolapsed iris was excised and proper care instituted, inflammatory reaction resulted, a secondary operation became necessary and ultimate vision was only $\frac{1}{2} \frac{2}{00}$, where a perfect result seemed almost certain before the accident.

Case 2.—A man, æt. 54, was operated upon for hard cataract of the left eye by Graefe's modified linear operation. The operation was smooth, and the eye was dressed in the usual way with a pad and bandage, and at night the hands were firmly secured to prevent his rubbing or striking the eye while asleep. On the fourth day the eye was examined. The wound was closed, pupil clear, and the eye free from inflammatory or other complications. On the 5th, the eye was dressed and examined, and everything was progressing favorably. On the fifth night the patient had his hands left free without authority. Toward morning the patient was awakened from his sleep by a severe blow upon the operated eye, which he had inflicted upon himself by bringing his hand violently against it. The pain was so severe that I was sent for and visited him at an early hour. The wound was torn open and the anterior chamber was filled with blood, a clot of which protruded between the lips of the corneal incision. The blood was evacuated as completely as practicable, and the eye carefully dressed. Iritis supervened. A quite thick membrane formed in the pupil, and a secondary operation

became necessary. The ultimate vision, fortunately, was good, being $\frac{2}{30}$.

Case 3.—A man, æt. 75, was operated upon by Graefe's method for extraction of cataract of right eye. The operation was smooth and the eye dressed as usual with pad and bandage and hands secured during sleep. On the fourth day the eye was examined. The wound had united, the pupil was clear and the eye free from redness. On the fourth night the patient turned suddenly on his face, struck his eye forcibly against the pillow, causing great pain. On examination of the eye it was found that the wound had been opened, the anterior chamber was found empty, and the dressings found wet and slightly stained with blood. Dressings were re-applied, and extreme caution urged against further injuries. On the sixth day the wound, which had again united sufficiently to hold the aqueous and restore the anterior chamber, was broken open by the patient while awake. He was sitting in a chair, and, in a state of reverie, suddenly brought his hand to his face, striking his eye with such force as to again re-open the wound. The pain caused by the blow was so intense at first, and the effect of the injury was so great that he nearly fainted. Again the wound united, but with a reddened condition of the eye, and an aggravation of the tenderness, which had existed, to a slight degree, ever since the first blow. On the third day after the second injury, although the attendant tried to watch the patient with

great care, he struck the eye again with his hand in a manner similar to that which had caused the second injury, and for the third time re-opening the wound. As a result, a low form of iridocyclitis followed, retarding recovery and ultimately leading to detachment of the retina. The latter result would not have followed, probably, had the patient not wilfully disobeyed instructions and used his eye sooner than he ought to have done under the circumstances.

These are the extreme cases that have occurred in my practice, and I presume that like cases have occurred to most operators, and that slight injuries have quite frequently occurred. They demonstrate that the ordinary pad of cotton and bandage afford but little if any more protection against severe blows, than the open method. Neither can such accidents be guarded against by pinioning the hands of the patient by the side, since he may suddenly turn, as did my patient, upon his face, and produce the injury. Nor can the "careful assistant or trained nurse," recommended by Mackenzie and others, prevent them, unless they keep their hands constantly upon the arms of the patient. If they fail to do this, the movement of the patient may be so sudden and rapid that the injury will be done before an attendant can catch and restrain him. Pinioning the hands of the patient becomes so irksome that few will tolerate it and they will loosen their hands and get their attendants to

omit the precaution after enduring it for one or two nights.

It would seem that the attention of the profession has not been turned to this subject as much as its importance really demands, for though only an occasional loss of an eye may follow from these injuries, to guard against *any* loss is the object of the prudent practitioner.

Within the last few months two communications on this subject have been made to the profession. The first of these was by Dr. H. Gifford, of Omaha, and appeared in the *Archives of Ophthalmology*, Vol. 19, p. 42. Dr. Gifford proposes to cover both of the eyes with "concave shields of stiff pasteboard, of such shape that the flaring edges may rest upon the bridge of the nose, the forehead and the cheek, while the arched centre is an inch or more from the eyeball. This is kept in place by an elastic band, but over all, to secure firmness, a monocular roller bandage covers that shield which is placed over the operated eye. Dr. Gifford's shield is easily made, and when firmly and securely applied, must offer quite complete protection from the kind of accidents I have mentioned, unless the shield should happen to slip from its place. In that case its edges very likely would take such a direction that one of them would press upon the eyeball. Under this shield the lids may be closed by adhesive plaster, or confined with the ordinary pad and bandage.

The objection to this shield is, that it is even

more impervious and heating to the eye than the ordinary bandage, and this is a sufficient consideration to lead some operators to reject it altogether. To remove this objection Dr. J. S. Prout,⁴ of Brooklyn, has proposed a wire mask,

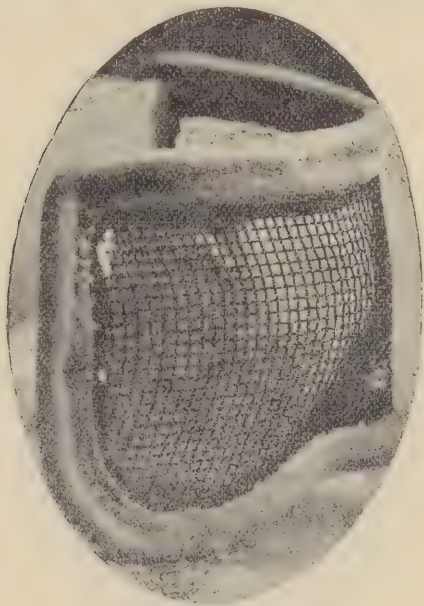


FIGURE 1.

made of wire netting such as is used for window screens, and fastened about the head by means of two tapes.

In remedying one defect and offering a covering which is light and cool, he proposed a form

⁴ The American Journal of Ophthalmology, January, 1891, p.1.

of dressing which evidently must be unsafe on two accounts. In the first place, it can hardly be held securely in place by the fastenings he proposes. Secondly, and mainly, it is, and must



FIGURE 2.

be, inefficient, by reason of the lack of stiffness, as a protection against the severe blows that are sometimes accidentally received by the operated eye, and against which Dr. Gifford's shield does offer protection. Again, an ordinary wire netting cannot, even when sufficiently firm, be

properly arched by any process to remain as a permanent firm concave surface, an inch or so removed from the surface of the lids. A consideration of the desirability of a dressing that, while cool and allowing free access of air to the eye, yet would be firm enough to resist severe



FIGURE 3.

blows, and so secured as to remain in place when applied to the most restless and unruly patients, led me to devise the mask which I here present. This mask is woven by a skilled wire worker,

after a pattern which I furnished. By its construction the arch is so firm that a powerful blow cannot indent it, so as to allow of pressure upon the eyeball over which it is applied. It is open and cool. It is fastened in such a way that the tapes cannot slip over the vertex of the head or

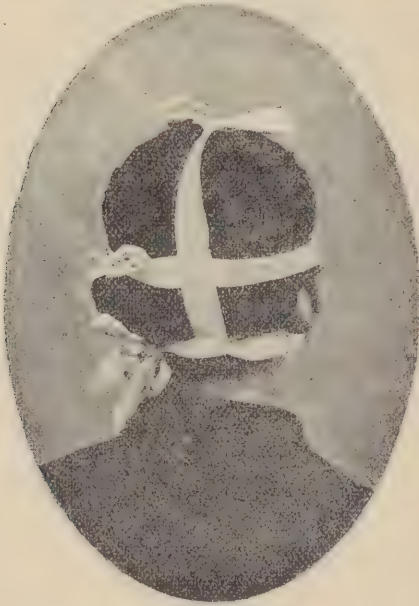


FIGURE 4.

in any other direction, and allow the mask to become displaced. It is so formed, that should it become displaced, the edges would not strike against the lids, but be carried away from the eyeball. It can be used over any form of dress-

ing. The open method may be followed and the patient allowed to use the unoperated eye if his attendant so desires, or it can be applied over a light pad of cotton, or the pad and bandage both, as the operator may choose.

While by no means perfect, I present it for the consideration of the Section, believing it to be the coolest and the most efficient of any dressing I have seen proposed, for protecting the eye from mechanical injury after extraction of the cataract, or while undergoing treatment for wounds of the eyeball, that might be re-opened by accidental blows or pressure.

The general form of the mask is shown in Fig. 1. It is bound about the edges with soft cham-
ois leather, or some other soft covering. When applied it comes well up upon the forehead, and down upon the cheeks, as shown in Fig. 2. To the lower and upper angles strong tapes are attached, which pass around the head. The lower one passes under the occiput low down, and when fastened firmly cannot slip upward. Those fastened to the upper angles pass around the head above the ear, and are prevented from slipping by a strong tape which is stitched firmly to the central portion of the lower tape, and also to its central portion, and is then tied firmly to another tape which is attached to the centre of the upper border of the mask and passes over the vertex of the head where the knot is tied, as shown in figures 2, 3 and 4. The mask is prevented from slipping upwards by two strong

tapes attached to the inferior angles and passing under the chin, where they are firmly tied, as shown in figures 2 and 3. Fig. 4 shows the position of the tapes at the back of the head and the central tape which passes over the vertex, and which, being prevented from sliding upward by the lower tape fastened below the occiput, is tied to the tape coming upward from the centre of the mask. This securely fastens the mask in such a way that it cannot slip downward. The mask is prevented from slipping to either side by its general form, but still more securely by the sharp curve fitting the nose, which is shown in Figs. 1 and 3. When properly applied it can only be displaced by such force as would break the tapes, and when this is feared, a firm bandage can be applied over it and about the head with so many turns, and with such firmness as to guard effectually against it.

